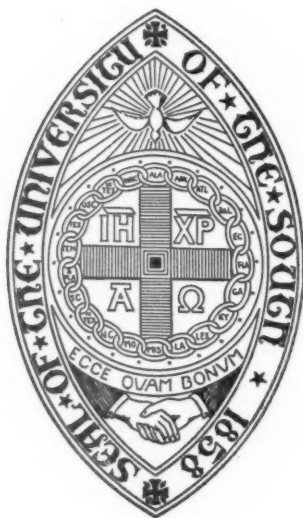


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THE CHRISTIAN MAN AND THE NATURE OF ATOMIC ENERGY

By WILLIAM G. POLLARD

It is important to consider the nature of nuclear energy in the light of the Judeo-Christian doctrine of creation. According to this doctrine the entire universe in all of its intricate structure, composition, and design is an expression of the will and purpose of its Creator. Nothing in it had to be the way it is. Everything could have been different, or need not have been at all had God willed it otherwise. Now a very great deal of the discussion one hears about atomic energy fails completely to take this fundamental character of things into account. Atomic energy in particular is often discussed not in terms of God's creation and the world He has provided for man to inhabit, but rather as an expression of man's will and purpose which is subject to our determination as to whether the world shall contain it or not. It is as though atomic energy were some sort of strange man-made phenomenon brought into being through an esoteric necromancy and quite unrelated to the normal world which was given to man to inhabit. Thus numerous people seem convinced that if scientists had only refused to work on such things, the whole problem would have passed away like a bad dream. It is as if A-bombs and H-bombs were thought of in the same category as Aladdin's lamp, that is, as something outside the natural order of things brought forth by a dark magic. Just as by an elementary moral choice, Aladdin could have removed from human experience the vast powers at his command, so many people believe that a handful of scientists could have, by a simple act of will, eliminated forever from the natural world the terrors of nuclear weapons. Thus the problem of atomic energy is commonly made to center around physicists, other scientists, and engineers, rather than around the structure and properties of the world we live in.

The basic building blocks of all matter may be reduced for the purpose of this discussion to the three particles: neutrons, protons, and electrons. Other elementary particles exist, but they are not important for our discussion here. Neutrons and protons are very similar; so much so indeed that they can be regarded as representing two states of a single particle which is often designated by the name *nucleon*. The most evident difference between them is in the positive electrical charge borne by the proton. The neutron, as its name implies, is electrically neutral and thus carries no charge. The electron is a particle with almost negligible mass compared to a neutron or a proton but with a

negative electric charge of the same amount as the positive charge on the proton.

When neutrons and protons come very close together, they attract each other with an extremely powerful force called the *nuclear force*. This force is entirely different from the more familiar gravitational force or the electrical and magnetic forces. Under the action of this force neutrons and protons are held together strongly in very small aggregates or droplets which form the core or nucleus of an atom. The neutrons and protons in such a nucleus are bound together very tightly by the powerful nuclear forces between them and can only be removed with the expenditure of a great deal of energy. Because of the protons it contains, such a nuclear droplet is positively charged electrically. As such it attracts to itself negatively charged electrons which move in closed states around it as the planets do around the sun. These electrons contribute almost nothing to the mass of the atom, but the much weaker electrical force which binds them to the nucleus allows their motion to spread out through a volume very much greater than that of the nucleus within which the neutrons and protons are constrained by the much more powerful nuclear forces. The region occupied by the electrons defines the over-all size of the atom and determines the way it forms molecules or crystals with other atoms. Essentially all of the chemical properties of atoms are determined by the outer electrons and are scarcely affected by the nucleus.

A single isolated neutron is the simplest atom of all, but it is unstable and will in a short time change spontaneously into an electron and a proton by a process known as radioactivity. The next simplest atom is an isolated proton with one electron moving in the space around it, and this is known as a hydrogen atom. A proton and neutron bound together by the nuclear force between them forms a nucleus known as a *deuteron*, and a deuteron with an electron associated with it makes an atom chemically like hydrogen which is known as *deuterium* or *heavy hydrogen*. A nucleus with one proton and two neutrons held together by the nuclear forces between them is called a *triton*, and the hydrogen-like atom formed from this with an electron is called *tritium*. A nucleus with two protons and one neutron will collect two electrons to form an atom of light helium. Two neutrons and two protons form an extremely compact, tightly-bound nucleus called an *alpha particle*. When an alpha particle acquires two electrons to go with its two protons, the resultant atom is one of ordinary helium.

THE NATURE OF NUCLEAR FUSION

All this is a necessary preliminary to a discussion of nuclear energy and the way it fits into the scheme of things. Nuclear energy is the kind of energy released when neutrons and protons draw together to form bound structures under the action of the nuclear forces between them. A mixture of the heavy hydrogen atoms, deuterium and tritium, will combine explosively into helium atoms with the release of tre-

mendous amounts of energy. The reaction, however, will not take place until the mixture has been ignited at an extremely high temperature of the order of several hundred million degrees. The hydrogen bomb is a device in which this is accomplished.

Hydrogen bombs are widely regarded as intricate products of human ingenuity entirely outside the natural order of things and inherently evil in themselves. It is true that the achievement of the enormous ignition temperature as well as the development of means to confine the explosive mixture long enough for the reaction to take place constituted a formidable technical task. But this does not alter the fundamental character of the reaction in which the fusion of hydrogen into helium occurs. This reaction is basic to the structure of matter and as natural a phenomenon as it is possible to find among all the manifold variety of natural phenomena. This is a point of primary importance in any consideration of atomic energy from a theological or ethical viewpoint. In order to place it in a proper perspective it will be well for us to turn our attention from the hydrogen bomb as a scientific and technological achievement of man to the same bomb as it occurs in nature. When we do so we shall find the whole question emerging in a quite different perspective.

Our own sun, and the great majority of other stars as well, are essentially naturally occurring hydrogen bombs in process of steady and continuous explosion. In order to see this most clearly it is helpful to consider the manner in which a star is formed. Floating in interstellar space among the stars are large diffuse clouds of gas and dust. The larger ones appear in the milky way as dark areas of very irregular boundary against the light background of distant banks of stars. These clouds consist mostly of hydrogen gas with smaller amounts of other gases, such as helium, methane, ammonia, and water vapor, in which minute solid particles float as a dust of metallic iron and mineral crystalites. It may well be that all of the matter in the milky way was originally in the form of this primordial gas and dust mixture. Such clouds tend over a long period of time to break up and coalesce around numerous condensation centers under the action of gravity. There are regions of the milky way where one can observe this process taking place now. At the edges of a cloud, small dark patches can be seen where portions of the gas-dust mixture have broken away from each other and are in process of falling in on themselves under their own weight into isolated masses. Once such a process has started, each such isolated mass becomes more and more compact and spherical in shape as the outlying matter falls in toward the center. The gravitational energy of such a mass is released as a heat of compression with the maximum heating occurring in the center of the mass. As the consolidation continues, the central temperature rises until ultimately the ignition point of the hydrogen is reached.

When this stage is reached, the hydrogen in the central core of the

mass literally explodes in a sequence of nuclear processes, such as we have described, which convert it into helium. Thus the slow process of gravitational consolidation of such a mass of primordial gas and dust is terminated with the ignition and explosion in its central core of a hydrogen bomb. This natural hydrogen bomb, however, unlike those ignited here on the earth's surface, has pressing down upon it in all directions great masses of unexploded matter extending upward and outward hundreds of thousands of miles. The massiveness of the matter and its enormous weight is sufficient to contain even the stupendous explosive power of a hydrogen bomb. As a result the bomb at the center is unable to blow the mass apart and so settles down to a steady and continuous rate of explosion of hydrogen into helium with the outward thrust of the exploding mixture being balanced by the inward pressure from the weight of the great mass of material pressing in upon it.

Our sun is just such a natural hydrogen bomb as this. It was formed at least three thousand million years ago and ever since has been explosively fusing hydrogen into helium in its central core at a steady rate. The temperature at the center of the sun is about 20,000,000° centigrade and the matter there, still consisting mostly of hydrogen and all in gaseous form, is compressed to a density about ten times that of lead. In this central core 650 million tons of hydrogen are consumed every second to form about 645 million tons of helium with nearly five million tons of heat and light radiated away from the surface of the sun each second. Thus it is a natural hydrogen bomb which keeps our own abode, the planet earth, illuminated, warmed, and energized.

There are something over two hundred billion stars in our own galaxy, the milky way, and the great majority of them are of the normal, or so-called main sequence, type which we have just described. They account for a large fraction of all the matter in the galaxy. Moreover, all of the other galaxies or island universes scattered throughout space are equally populated with such stars. Thus the natural hydrogen bomb is by far the most common thing in all creation. God has made hydrogen bombs in profuse abundance and scattered them throughout his creation. Whenever one is tempted to denounce the hydrogen bomb as an inherently evil, man-made contraption dependent for its very existence on an esoteric form of scientific necromancy, one would do well to look out at the sky on a clear night and reflect on the extent to which hydrogen bombs are an essential and abundant part of the world which God provided for us to live in.

There is a great danger in our making inadequate or erroneous judgments simply as a result of limitations in our perspective. Most people would agree that an ordinary fire in which wood or coal burns in the presence of air is a quite common and ordinary phenomenon and a part of the natural order. They would also be equally quick to agree that the explosion of a hydrogen bomb is an extraordinary scientific

and technical achievement of human ingenuity quite outside of and apart from the natural order of things. Yet from God's viewpoint the situation is just the reverse. In order to have an ordinary fire one must have a planet with an atmosphere containing free oxygen and buried stores of fossilized fuels, such as coal and oil, or else growing plants like grass and trees which synthesize cellulose or other unoxidized carbon compounds. But this is a truly extraordinary combination of circumstances which is not likely to occur at very many places in the universe. Our earth is one of very few spots in all creation where the ingredients for an ordinary fire can be found. From the standpoint of a being capable of freely ranging throughout space, the observation of fires here on earth would be an extraordinary curiosity, quite bizarre and unnatural. Such a being, on the other hand, would, as we have seen, look upon hydrogen bombs as the most common and ordinary kind of thing in existence and so as natural a process as could be imagined. He would also know, as some of us do not realize, that a universe from which hydrogen bombs had been banned would be a dead universe with no life or light or warmth in it.

THE NATURE OF NUCLEAR FISSION

In discussing the process of energy release in the explosion of a hydrogen bomb, we have been talking about only one form of what is generally referred to as atomic energy. It is the form of energy released in the process of fusion whereby free neutrons and protons or small combinations of them, such as heavy hydrogen, fuse under the action of the nuclear forces into larger aggregations, such as a helium nucleus. Actually the energy released in nuclear fusion is strictly speaking the only form which can properly be called *nuclear* energy. There is, however, another form of atomic energy which arises from a quite different process known as *fission*. This energy is released when the nuclei of the heaviest elements, such as uranium and plutonium, divide into smaller fragments. It is the process of fission which is responsible for the energy released in an atomic bomb or in a nuclear reactor.

In order to see how the process of fission occurs, we must concentrate our attention on the opposition between the cohesive nuclear forces which hold neutrons and protons together in the atomic nucleus, and the electrical repulsion of the protons due to their positive electrical charge as a result of which the protons tend to explode the nucleus. When there are only a few neutrons and protons in the nucleus, the repulsion between the electrically charged protons can be ignored in comparison with the powerful attraction of the nuclear forces between all the particles. This is the case with the light nuclei of hydrogen, helium, and lithium which are involved in fusion processes. Then the actions which take place are purely nuclear and non-electrical in origin, and the energy released is quite properly called nuclear energy. As we

go to larger and larger nuclei, however, containing a correspondingly larger number of protons, the amount of positive electrical charge packed into the very small volume of the nucleus becomes large enough to produce increasingly important electrical effects. This begins to be significant with a nucleus containing twenty neutrons and twenty protons which forms an atom of the chemical element calcium. By the time we get to the largest nuclei, such as those of the elements thorium, uranium, and plutonium at the end of the periodic table, this effect has become dominant. The explosive tendency of the positively charged protons is almost but not quite equal to the cohesive tendency of the nuclear forces. It is the opposition of these two forces which explains why the table of natural elements ends at uranium.

An atomic nucleus can be thought of as a tiny liquid droplet like a water droplet. In it the neutrons and protons take the place of the water molecules. Just as water molecules cohere into a liquid droplet under the action of the intermolecular forces between them, so neutrons and protons cohere into a nuclear droplet under the action of the nuclear forces between them. A gas of free neutrons and protons would, on being cooled, condense into a nuclear fog just as the water vapor in damp air condenses to form ordinary fog when it is cooled below the dew point. Different sizes of nuclear fog particles would be formed just as in the case of an ordinary fog, and each such tiny droplet would form the nucleus of a particular kind of atom. Indeed there is such a thing as nuclear fluid just as there is liquid water. As a result of the enormously greater power of the nuclear forces, however, nuclear fluid has radically different properties from water. Its boiling point is measured in billions of degrees centigrade instead of a hundred degrees, its heat of vaporization is hundreds of millions times that of water, and the density of nuclear fluid is two billion tons per cubic inch.

If it were not for the fact that the electrical charge on the protons operates in opposition to the cohesive nuclear forces, there would be nothing to prevent all the matter in the universe from ending up as bulk nuclear fluid. A mass of damp air first forms a cloud made up of many microscopic fog particles. With further cooling these minute droplets grow in size as condensation on them continues, and they coalesce to form rain drops. Ultimately the rain drops coalesce into streams and these finally join to form bulk masses of water in river, lake, or ocean. So too, if only the cohesive nuclear forces were involved, nuclear droplets would grow in size until first a nuclear rain was formed, and finally bulk nuclear fluid. In that case the widespread dispersal of matter into atoms, which we know in the world as it is, could not have been maintained. Matter would instead necessarily have had to occur almost exclusively in the form of bulk nuclear fluid with a density of two billion tons per cubic inch.

Actually, however, the positive charge packed inside a nucleus grows with the number of protons in it and therefore with its size. In the

largest nuclei, such as uranium, the cohesion of the nuclear attraction of the neutrons and protons for each other is just barely able to contain the large electrical charge packed into the nucleus through the protons. In this situation it happens that a very slight disturbance of the nucleus, such as that resulting from the capture of a single neutron, can trigger the process in which the packed positively charged protons push each other apart with a greater force than the nuclear cohesion. As soon as this point of instability is reached, the nucleus divides explosively into two fragments which are driven apart by the electrical repulsion between them with great force and accelerated to high energies. This is the process of fission and we can see from this explanation of its origin that the energy released in it is electrical rather than nuclear. It is the same form of energy as that released by a discharging condenser or a lightning flash. It was only because of the nuclear forces that the positive charge in the uranium nucleus could be packed together so closely. But when the instability resulting in fission develops, it is the stored electrical energy in it which breaks loose and is released. Clearly the nuclear forces being attractive can only release nuclear energy when neutrons and protons go together to form larger aggregates. Thus it is only fusion which releases nuclear energy. Fission necessarily occurs in opposition to the nuclear forces and the energy released in it can only come from the repulsive electrical force. Thus the energy released in the explosion of an atomic bomb or in the power plant of the submarine NAUTILUS is not, contrary to widespread notions, a strange and hitherto unknown form of energy. Rather what is being released in both cases is as familiar as a lightning flash.

Energy releases through the process of fission do not occur in nature at all, with the possible exception of the tail end of the explosion of a supernova which is a rare occurrence. In this respect the explosion of an atomic bomb represents a phenomenon unparalleled in the natural world and so is quite the reverse of the status of the hydrogen bomb as presented earlier. Uranium in nature is rather widely dispersed and in natural uranium it is only the isotope of atomic weight 235 which is fissionable under conditions essential for the explosion of a bomb. It is only, therefore, through human intervention that uranium-235 can first be separated out of natural uranium and then assembled in concentrated form in sufficient quantity to permit such an explosion to take place. In this sense an atomic bomb, in distinction from a hydrogen bomb, represents a truly man-made phenomenon.

If we concentrate our attention on the fission process itself, however, rather than on the energy releases attending it, we shall be able to see how essential it is to the nature of things. As we have already noted, fission arises as a result of the opposition between the cohesive nuclear forces between neutrons and protons which bind them together into nuclei, and the repulsive electrical force which the positively charged protons exert on each other. It is this opposition which is basic-

ally responsible for keeping matter dispersed into atoms rather than massively consolidated into bulk nuclear fluid. The relative strengths of these two forces are so adjusted that elements heavier than uranium are so unstable that all of them long ago underwent fission or other transformations which reduced them to elements lighter than uranium. Thus this balance of forces is responsible for the fact that matter in nature is distributed among only 92 chemical elements. If the force of electrical repulsion between positive charges were larger in comparison with the nuclear force, fission would develop earlier with smaller nuclei, and the number of chemical elements would be less, ending perhaps with silver rather than uranium. If on the other hand the electrical repulsion were weaker than it is in comparison with the nuclear attraction, fission would not develop until heavier nuclei had been formed and the natural chemical elements would extend considerably beyond uranium.

These considerations point up the essential role which the phenomenon of fission plays in determining the very possibility of the kind of world which exists. The dispersal of matter in a finely-divided form as atoms is fundamental to the nature of things in our world. The atoms of the chemical elements combine to form molecules. The rich and varied assortments of intricate combinations of atoms in molecules make possible the wonderful variety of the world. Because fission keeps atomic nuclei from growing in size much beyond uranium, the small atoms—hydrogen, carbon, nitrogen, and oxygen—are able to exist in perfectly stable forms protected, by the same electrical repulsion which produces fission, from coalescing with other atoms. Because these atoms exist, their intricate combinations into carbohydrates, fats, amino acids, enzymes, and hormones, and nucleic acids are possible. Finally, because the world is so made as to contain such complex molecular associations as this, it is possible to have in our world living organisms, including we human beings ourselves. Yet the world cannot be provided with such marvelous possibilities as this and still be the kind of world in which atomic bombs are not a possibility. The two, as we have seen, go hand in hand. Uranium and plutonium must have the properties which make atomic energy through fission possible in order that carbon and oxygen, iron and silver, can exist. A universe in which atomic or fission bombs were outlawed would be a universe in which the fundamental atomic building blocks, out of which living things are made, could not even exist at all.

The discoveries of the last twenty years have revealed to us broad aspects of the fundamental basis of the design and structure of things in God's creation which have been hidden from the rest of mankind. It is small wonder, therefore, that in such a brief period men should experience grave difficulty in adjusting themselves and their perspective to such a radically expanded and changed view of the nature of the world which God has provided for them to inhabit. Yet all that we

know of God as He has revealed Himself to us suggests that it must be an occasion of rejoicing on the part of our Creator that His creature man has now come to share with Him this vision of the wonderful scope and fitness of His handiwork. When seen in this broader perspective, we realize that it is not only fruitless but really irreverent to rebel against the existence of atomic and hydrogen bombs, and to wish for a world in which we would not have to contend with such vast power. When in our littleness and finiteness we come forth with proposals to ban atomic or hydrogen bombs forever from our scheme of things, we would do well to reflect on the consequences of the application of such a ban by God to creation as a whole.

We may be terrified by the awful potentialities which have been built into the elementary structure of the world which we have been given to inhabit, but that does not alter the reality of that world. There is no black magic here which we can have or not have by our own volition, which we can accept or reject as we please. We did not design or create this world, nor is it open to us to decide how it shall be ordered. We did not even make ourselves. It is a fundamental fact of our existence, which our contemporary and largely secular culture tries desperately to ignore, that we are finite creatures whose very existence is contingent on the will of our Creator and that the world we have been given to inhabit is His handiwork, not ours. We must endeavor to live in the world as it is given to us even though, as we have now discovered, that world has been endowed by the providence of its Creator with uranium and thorium and hydrogen together with all the terrifying powers which accompany them. The real question is not whether scientists should or should not engage in work which leads to atomic energy developments. The real question is how can man, finite, perverse, and sinful creature that he is, find the power and the wisdom to inhabit a world in which such fearful vessels of destruction exist. This is not only sound Christian theology. It is a straightforward statement of the facts of our existence and the reality of our situation.

THE NATURE OF FALLOUT

A problem closely associated with the nature of atomic energy is that of the radioactivity of the fission fragments. When a heavy nucleus undergoes fission by dividing explosively into two smaller nuclear fragments, the fragments always have a large excess of neutrons over protons compared with their stable counterparts of the same atomic weight. This is associated with the same repulsive electrical force between the positive charges on the protons which is the source of the fission process itself. The large nuclei near the end of the table of elements have a strong bias in favor of neutrons over protons. Although an added proton experiences the same nuclear attraction in approaching the nucleus as that experienced by a neutron, the large amount of positive charge already in the nucleus exerts a strong repulsive force

on the proton which the neutron, being uncharged, does not experience. As a result of this effect, the larger a nucleus becomes the more is the number of protons in it depressed with respect to the number of neutrons. If we think of atomic nuclei as minute fog particles of nuclear fluid growing in size by condensation out of a neutron-proton vapor, then one can see that the larger droplets, with a large number of protons in them already, would have a strong preference for condensing more neutrons than protons. In the light elements from hydrogen to calcium the number of neutrons is approximately equal to the number of protons which makes the atomic weight approximately double the atomic number. The most abundant form of calcium has twenty neutrons and twenty protons so that its atomic number is twenty and its atomic weight forty. From calcium on, however, the stable elements have an increasing excess of neutrons over protons. By the time we reach the end of the table of elements, this excess has increased to as much as sixty per cent. Thus the most abundant form of uranium has 146 neutrons in its nucleus compared with only 92 protons.

When a uranium or plutonium nucleus undergoes fission, it divides into two smaller fragments each of which still carries with it some sixty per cent more neutrons than protons. The stable nuclei of the same size as these fragments, however, have only about forty per cent or less more neutrons than protons. As a result the fragments are quite unstable and undergo a whole series of transformations which convert neutrons into protons by radioactive change. The process of radioactivity is one in which a neutron within a nucleus generates a negatively-charged electron and another particle called a neutrino. This pair of particles are radiated from the nucleus with considerable energy while at the same time the neutron which produced them changes into a positively-charged proton which is bound more tightly in the nucleus than was the original proton by an amount just equal to the energy radiated away in the electron and neutrino. By this process each fragment from the fission of the heavy nucleus undergoes a sequence of radioactive transformations each one of which converts another neutron into a proton with the emission of energetic radiation.

The discrepancy between the excess of neutrons in heavy nuclei and that in stable forms of the fragments into which it divides makes an intensely radioactive waste product an unavoidable complement of the fission process. When an atomic bomb is exploded an appreciable fraction of the original uranium or plutonium metal composing the bomb is converted by fission into an assortment of lighter elements in accordance with the various fragments into which the uranium or plutonium nuclei divided. Among the elements represented in this debris of the explosion are the noble gases krypton and xenon, familiar elements such as silver, tin, and iodine, and unfamiliar elements such as tellurium and praseodymium. At the moment of the explosion each of these varied fission fragments is released at very high velocity by

the electrical force which drives them apart and as a result the entire mixture is formed at an enormously high temperature measured in millions of degrees. Thus the debris of the explosion is completely vaporized, and being quite hot and of low density, the entire body of it rises quite rapidly to form the characteristic mushroom cloud. After being carried in this manner to great heights into the stratosphere, the cloud cools to a temperature at which the vapor condenses into a fog of minute dust particles consisting of solid crystalites of the mixture of elements composing it.

The radioactive dust cloud so formed is thereafter dispersed by stratospheric air currents and added to the general world-wide burden of meteoritic dust in the stratosphere. The larger particles fall out of the cloud rather early and return to the earth's surface in a pattern determined by the local meteorological conditions which is, related to the point of the original explosion from which they came. The very small particles, however, remain in the stratosphere for periods measured in years and only very slowly diffuse back to the earth's surface. A small residuum of the radioactive dust debris from the Hiroshima and Nagasaki explosions in 1945 is still falling out of the stratosphere over land and ocean areas although in the intervening thirteen years most of it has already come down.

The fallout dusts are, as we have seen, made up of many different chemical elements around the middle of the periodic table. Initially each constituent is a highly unstable form of its element which will go through a number of successive radioactive transformations before reaching a stable non-radioactive form. Most of these transformations are fairly rapid, and as a result the initial very intense radiation emitted from the dust cloud decays rapidly. A few days after the explosion the residual activity in the cloud has been reduced by several orders of magnitude from the initial value. Among the great variety of fission fragments making up the original cloud there are two, however, which undergo their radioactive transformations very much more slowly than the rest. These are a form of the chemical element cesium of atomic weight 137 and a form of the element strontium of atomic weight 90. The cesium decays at such a rate that the intensity of radiation emitted from it is cut in half every thirty-seven years and the strontium at a rate which halves its activity every twenty-five years. Unfortunately both of these constituents are produced rather abundantly in the fission process. As a result the radioactivity of the cesium and strontium in the fallout dust particles continues for several decades after the explosion which produced it. The cesium and strontium produced in the Hiroshima and Nagasaki bombs and scattered for the most part over the earth's surface is today only 25 per cent less active than when these bombs were exploded in 1945. Every test explosion of an atomic bomb since then by the United States, the Soviet Union, and the United King-

dom has produced and added to the stratospheric burden corresponding additional amounts of radio-active cesium and strontium.

The waste products from an atomic explosion which reach the stratosphere become dispersed by prevailing air currents there in a wide band circling the earth and extending north and south over the median latitudes. From there the fine dust particles slowly drift downward and eventually fall back to the earth's surface. This process goes on for a period of about ten years after an explosion during which the larger part of the waste from the explosion returns to the earth. On reaching the earth it either remains in ocean waters or in soils over land areas or else is incorporated into the life cycle through absorption with other dissolved minerals by algae in the ocean or plant life on the land. In this process of incorporation into living organisms, the cesium behaves very much like sodium and so follows much the same path in plant and animal metabolism as that of common salt. On reaching man through his food it remains in his body only a short time before being excreted. The strontium, on the other hand, behaves chemically very much like the element calcium. Any radioactive strontium which may be present in the milk, vegetables, or meat which we eat tends therefore to be incorporated along with calcium in our bones and so to remain with us for long periods of time. For this reason it is the strontium in the fallout dusts which represents the major hazard to human beings.

The extent of the hazard to human life and especially to future generations in this situation is difficult to evaluate, and even more difficult to place in a proper perspective. The effect of high energy radiations on human beings is invariably one of biological damage. One should not allow instances of the effective use of such radiation in the treatment of cancer, or its application through genetic mutations in plant breeding, or with microorganisms to produce new and improved strains, to obscure this basic fact. In the treatment of cancer penetrating radiation is used by the radiologist to the same end as a knife or electric needle is used by a surgeon. The only way in which it can lead to a beneficial result is through restricting its destructive power to abnormal tissue whose presence was undesirable to begin with. In the other case the vast majority of all the mutations induced by the radiation are undesirable if not lethal. Only in situations in which many millions of individuals are involved from which an isolated instance of a single mutant with improved characteristics can be selected is radiation of any value. By some strange quirk a tornado might produce rearrangements in a building which would improve it. But this does not change the fact that a tornado does in fact leave a trail of havoc in its wake. The only thing that can be said about radiation in an analogous way is that it invariably leaves a trail of genetic havoc in its wake. The only results which can accrue to mankind from the continual pumping of fresh radioactive dusts into the stratosphere from atomic explosions

are undesirable, if not hazardous. Nothing in the least degree beneficial can be anticipated from this situation.

On the other hand it is easy to exaggerate this hazard. Radiation is such a new, strange, and esoteric thing in the minds of the majority of people that they naturally develop an emotional reaction against it. There was no radio-caesium or radio-strontium in the world until they were ushered in with the atomic bomb. In that association they are likely to seem wicked and evil substances in themselves, and the pollution of an otherwise apparently pure and radiationless atmosphere with them a process which must be avoided at all costs. Here too the need for a wider and more balanced perspective is paramount. For the achievement of such perspective the most important step which is required is the realization that there is nothing new or unnatural in the idea of exposing mankind at large to radiation. Throughout the history of the human species on this earth human life has been immersed in a sea of radiation. This natural background of radiation to which we have been exposed all along without knowing it has two sources. One source is the cosmic radiation which comes into the earth's atmosphere from outer space. The other source is from naturally occurring radioactive materials such as uranium, thorium, and a form of potassium of atomic weight 40. The cosmic radiation is uniform in intensity from place to place on the earth's surface but increases with altitude. People living at high altitudes, such as communities in the Himalayas or the Andes are exposed to considerably more radiation than those residing at sea level. Thus the people of Denver have double the cosmic ray exposure of those in New Orleans. The radiation exposure from uranium and thorium, on the other hand, varies widely from place to place on the earth, depending on the concentration of these materials in rocks, soil, and water in each locality.

It is only when we consider the fallout problem against the background of this natural radiation to which we are all exposed that we can acquire an adequate perspective on the problem. The radioactive caesium and strontium fed into the stratosphere and ultimately spread around the earth from the explosion of an atomic bomb do not add something completely novel to our environment but rather merely add their bit to the general sea of radiation which already exists. In order to evaluate the hazard which these new additions represent, we must therefore determine the degree to which they have increased the natural level of radiation. Fortunately this is a reasonably soluble problem and a fairly definite answer can be given to it. The total amount of caesium and strontium produced by all the nuclear weapons which we have exploded since the first one at the Alamogordo, New Mexico, test site can be fairly accurately determined. To this must be added an estimate of the amount produced in all of the test weapons exploded by the Soviet Union and the United Kingdom. Assuming this total production to be uniformly spread over the northern hemisphere, we

can then arrive at a rough estimate of the amount by which it has increased the natural radiation exposure. The result turns out to be about three per cent which means that all the nuclear weapons tests to date have resulted in adding about one-thirtieth more radiation to that which existed prior to the development of atomic bombs.

Commissioner Willard F. Libby of the Atomic Energy Commission has expressed this result in a way which makes it directly applicable to other aspects of human life which are a part of common experience. One way in which he puts it is that any individual prior to the atomic age would have experienced the same increase in radiation exposure by moving his residence to a new locality 300 to 400 feet higher in altitude as the increase which we now experience as a result of all the tests which have been held to date. Another way to express the same result is that a greater radiation exposure might be experienced by a family moving from a frame house into a stone or masonry house in some localities than that arising from the fallout radiation. The reason for this is that natural stone from certain quarries and brick or concrete block made from some clays or sand will contain enough traces of uranium or thorium to constitute a greater difference with respect to wood than that represented by the concentration of cesium and strontium presently built up from nuclear weapons. Another contrast of this sort can be made by comparing radiation exposure from nuclear weapons with that which we receive from other man-made sources such as X-rays. In a highly civilized country such as America the amount of radiation received by large numbers of the population through medical diagnostic and therapeutic X-rays exceeds by many, many times that received from world-wide fallout.

The actual extent of the biological damage arising from continuous exposure to low levels of radiation is not well known and is very difficult to evaluate. The Atomic Energy Commission is presently supporting a large-scale research effort to determine these effects in its own laboratories, such as those at Oak Ridge, Argonne, and Brookhaven, as well as in many university laboratories and experiment stations throughout the country. In time we may expect to obtain a fairly reliable estimate of the degree of hazard to be expected from a given level of radiation exposure. Another approach which is also being followed is to study certain isolated communities which have been exposed for several generations to unusually high levels of natural radiation. Such communities can be found at high altitude locations in the Andes and the Himalayas, as well as in certain other special locations such as a fishing community in India built on land consisting of monazite sand with a high thorium content. Unfortunately such communities do not maintain medical records, and the extent to which reliable information about the incidence of leukemia or the frequency of miscarriage or still births can be collected is very limited.

At the present state of our knowledge there are two main effects

which can be expected from this kind of radiation. One of these is the possibility of the development of leukemia in a few individuals and the other is genetic damage arising from radiation-induced mutations in the germ plasm of the exposed individual. This second type of damage is of course more insidious since the affected individual has no way of knowing that it has occurred and the results of it are passed on to successive generations. In neither case, however, can we give any reliable estimate of the degree of hazard involved in a three per cent increase in the natural level of radiation. This is because we do not know how much of the natural incidence of leukemia or of the normal rate of mutations in the population as a whole is due to radiation and how much to other causes such as temperature, diet, other diseases and the like. In any event, however, whatever portion is due to radiation would probably be increased by fallout radiation in the same proportion as it increased the natural radiation level.

The moral problem posed by the continuation of weapons tests, in the face of the realization that every new atomic explosion which is set off adds that much more radioactive material to a world-wide burden which will continue to add its share to the radiation level over the face of the whole earth for the next half century and longer, is extraordinarily difficult. For those who have simplified the problem in their own minds to a manageable level at which the whole idea of modern warfare with nuclear weapons is simply rejected, the problem is already solved. For them the course is clear cut. We simply unilaterally cease all nuclear weapons testing immediately. But for those whose opinions on this vital issue enter into the determination of the actual course of our national policy, the problem is more difficult. These persons, such as the President, the members of the Joint Congressional Committee on Atomic Energy, and the members of the Atomic Energy Commission, who are elected by the rest of us to actually determine the course of our national policy through the stormy seas of contemporary history, must not only try to reach a theoretical resolution of this problem, but must also make decisions in accordance with actual concrete possibilities. Anyone who doubts that the problem is taken as seriously by such people as it merits would do well to obtain copies of the copious two-volume series of hearings held last year by the Joint Committee on Atomic Energy. There is no question about the seriousness with which this problem is being considered by those with whom the final decision lies.

No one of course can feel comfortable about carrying the burden of responsibility for adding to the already existing levels of radioactive wastes which the whole earth must sustain by agreeing to the explosion of a single additional atomic bomb. There are, however, so many other factors involved in the making of such decisions. Tremendous issues of human freedom and even of the destiny of mankind are at stake. The wise guidance of our nation through the stormy seas of contemporary

history is surely not an easy or clear-cut task even for the wisest and most Christian among us. A mistaken decision made in the interest of a genuine but drastically naive morality could so easily result in condemning vast areas of the world to a tyranny and barbarism beside which the sample of Hungary would pale into insignificance. From the moral standpoint would the sum total of evil done to the world be lesser or greater if such a course were in fact adopted by the nation? How can men gain the wisdom to answer such difficult questions with assurance? In the end it seems that all one can do is to examine each proposed new test on its merits, demand of those who propose it the most exhaustive justification, and then try to decide whether or not the test should be conducted. We should pray ardently that God will guide those elected to make such weighty decisions for us. But beyond that we should ask ourselves whether there is really any other way by which national policy in these dark and uncertain times can be determined.

The moral problems with which atomic energy confronts us are not so radically different from those which confront us in many other areas. In most cases of major issues, indeed, we are presented with a bundle of dilemmas from which, in the limited wisdom of our finite human estate, we seem incapable of extricating ourselves. There are many hazards of life in our complex technical civilization of today which are comparable to or even more serious than those arising from the present level of nuclear weapons testing. Some geneticists have pointed out that the widespread application of modern scientific measures in public health and sanitation may in fact be retaining undesirable genes in the whole human species on a scale far greater than any which could conceivably be attributed to mutations from the excess radiation due to nuclear fallout. Others have noted that the present level and contemplated increases in the rate of combustion of long buried fossilized fuels may be producing a poisoning of the atmosphere much more grim for the status of human life on the earth than that attendant on the present level of nuclear testing. The well-known Los Angeles smog is an ever-present reminder to the people of that city of the fact that the automobile is not an unmixed blessing. To this we could add the statistics of the National Safety Council on the annual harvest of human tragedy and death which the automobile has brought with it. In these cases we can only conclude that life at best is a hazardous and dangerous business with many of its hazards directly attributable to our own technology. In each case we not only have to decide what is best to do under the circumstances, but also how much of it we are free to do within the limitations imposed upon us by the situation in which we find ourselves. There is hardly any other basis on which we can proceed, even in the admittedly grave case of nuclear warfare.

WHY TEACH THE OLD TESTAMENT?

By CLAUDE SAUERBREI

One hears frequently, and in various places, the statement that the graduates of our theological schools do not know the Bible. It is probable that this complaint is, on the whole, justified and it is the purpose of this article to discuss the teaching of the Old Testament, its place in the seminary curriculum, its methods and content, and the degree of our failure to teach it properly, and to make suggestions about what should be done to improve it.

The first question we must answer is, Why teach the Old Testament? For it is obvious that unless we have a good answer to that question, all the other questions are scarcely worth asking or answering.

1. The Old Testament is an official part of the Anglican body of teaching. It is part of the foundation upon which rests the statement of our faith. Roman Catholicism respects the Scriptures, but has them already digested into a dogmatic structure. The Roman Catholic is not invited to test his dogmas by scripture; the Church guarantees them and is well aware of the danger of over-curious questioning about the basis of its definitions or the correctness of its interpretations. In practice then even the instructed Roman Catholic can do very well without any knowledge of the Old Testament.

At the Reformation the Protestant position was that the Scriptures contained the Christian revelation and that their authority enforced it both as a whole and in its parts. The authority of the Bible, however, has in experience always needed an interpreter: the Reformation hoped that the individual would supersede the Church in this function, the Spirit would give authority to the interpretations of the individual who relied on the revealed word. In practice this has led to the excessive subjectivism of the Protestant mind and the endless fragmentation of protestant organizations. Protestantism has been deeply affected by the modern critical approach to the Bible, and as the august character of the infallible book has seemed to be diminished by the solvents of scientific study an attempt has been made to substitute other values for what has been lost. Thus we hear much of the literary value of the Old Testament, of the evolution of religion that is exhibited therein and the illustration it sheds upon both those highly fashionable modern studies: evolution and comparative religion.*

*Although the evolutionary development of religion is supposed to exhibit God's action in history, one feels that his part was somehow less than that of a divine revealer. He merely initiated a process that developed; and one feels that the later phases were mostly the work of man—that sublimely evolving animal. Similarly when

In Anglicanism. The Holy Scriptures of the Old and New Testaments were accepted evidently as a regulator of doctrine. The Anglican reformation had no doubt that the Church was the guardian of the Faith, and that by and large it had preserved it. But it had grave doubts about certain practices that had grown up and about the doctrines that were taught in justification of these practices. It therefore took the step of declaring that no doctrine which was manifestly without support in Holy Scripture could be taught as necessary to salvation. In other words it held the Scriptures to be the regulator, the preserver and restrainer. It is noticeable that the character of Anglicanism appears distinctly here. It desires to be conservative but conservative critically, correcting itself and its tendencies by discovering, and by encouraging the examination of, a reliable history of the Church: but history not only lives and changes, it also embodies itself in static and fixed forms in *histories*. For the Church the Holy Scriptures and especially the New Testament are the unchangeable deposit and record of the Church at a very early time. Another character of Anglicanism that appears distinctly at the time of the Anglican reformation is its attempt to let itself be held in a median position by the tensions exerted by opposite extremes. Between the rigidity of institutional authority, and the capriciousness of biblicism which is held to give authority to the vagaries of private judgment. Anglicanism believed there could be discerned a middle course, a plan which could control the excessive institutionalism of the right and the excessive individualism of the left. This plan was tempering of ecclesiastical authority by constant reference to the scriptures, at the same time the interpretation of the scripture was to be restrained from exorbitancy by the constant appeal to traditional interpretation, and if necessary by the exercise of the Church's authority. It seems obvious therefore that those who aspire to the ministry of the word and sacraments should be thoroughly familiar with the Scriptures which are so closely related to the dogmas of the Church.

2. It may be objected here that what has been said above is very true of the New Testament but it appears to be less true of the Old. This objection is as serious as it is ancient. Theological students, as a rule, take a great interest in the New Testament, but they study the Old under duress—they would get out of it if they could. The early church however had no doubt about the utility of the Old Testament because it held that the Church, the New Israel, had arisen from the Old Israel by the action of the Almighty and according to his plan. It may not be too much to say that in the first centuries when the New

the Christian (or Jewish) religion is integrated into a scheme of comparative religions, with the inference that it differs from them not essentially but, however sublimely, only in accidents, it loses the august and supernatural claim which it makes on the human heart and mind. Religion was a great voice commanding man, now it is a cultured and scholarly monotone which suggests that properly interpreted religion may yet be not impossible for the intelligent modern man to believe.

Testament was in formation, the evidence of the Church's existence, so far as that evidence was literary, *was* the Old Testament: to have slighted it was to the orthodox unthinkable.

3. But, granted that the Old Testament was a necessary part of the early church's credential, new reasons to value it soon appeared, or perhaps it is truer to say that old values, old methods of interpretation, soon began to be exercised in the service of the Christian religion. The teachings of the Fathers are so closely interwoven with the words of Scripture that we can easily see that their reading must have been constant and meditative; they became, so to speak, impregnated with both the sense and the words of the text, to such any extent that when they thought about the dogmas of the faith they found it easy to express their thoughts in scriptural words.. When they taught Christian conduct they found examples of all the virtues in the Old Testament's gallery of saints and heroes: or if they wished to warn against vice they could vividly illustrate from the same pages the awful predicament of the wicked. They were not particular about methods of interpretation. Some parts were easy to understand in their literal meaning. Some parts were most valuable if they were accepted as types of Christian verities, others again suggested allegories to the contemplative mind. Often a word, a phrase, or an incident seems prosaic and dull, but to men who were reading what they believed to be inspired writing, it was valuable, and often they succeeded in bringing hidden values to light.

4. This view of the value of all the words of Holy Scripture, this conviction that it was all profitable for doctrine and edification fructified the study of the scriptures in the past. The feeling that the scriptures were a latent source of revelation and consequently of religious experience and power was strong in the Saints and Doctors of the Church: from the written page they expected light to blaze forth, or they expected comfort or spiritual satisfaction. Therefore the written page was not static, its meaning had not been exhausted by former exegetes nor its contents consumed by earlier expositors—it was like the widow's meal and oil, constantly renewing itself for the nourishment of the faithful. It was not looked upon as literature, or as history; it was most certainly not a repository of information bearing on the study of comparative religion. They did not despise those parts of it that seemed shocking or primitive or explain them away as primitive stages in the natural evolution of religion. They were not afraid of being called obscurantists.

Therefore they were free to interpret the Scriptures in any way that seemed to them most profitable and their ingenious and profound minds, by a variety of methods, explored them and found mental and spiritual treasures that repaid them amply for their labours. For it was a labour. Spiritual search is always a labour, and it may be in the

wisdom of God that Biblical study is difficult, that the fruits of it may be more precious.

5. How different Old Testament studies have become in our days. There is a group of ancillary studies seeking to shed the bright light of exact science upon it. Criticism of the text of the Bible has been intense (perhaps not exactly scientific at times) and has swept away not only the old confidence in the dependability of the very letters of scripture, but also our trust in authorships and dates, the historicity of important events. Geography has presented us with reliable maps of the holy lands. Archaeology has given us the power to see what lies beneath the surface and has turned time backward by revealing the daily life of the people of the Bible: the harsh splendour of the conquerors and the hard poverty of the common folk. Comparative religion has discovered a vast number of phenomena which are said to be living examples of what ancient Hebrew religion was when it was alive; allied with the theory of evolution comparative religion undertakes not only to show us by analogy what were the original forms of Hebrew religion but also to trace its development from animism to ethical monotheism. Historical science with its handmaids epigraphy, paleography and comparative philology has made a synthesis of the results and offers us a much more complete and accurate account of the events of Biblical times than we ever could have had in the days, say, of Archbishop Ussher. History has even brought in astronomy, so that the stars in the courses can now give us an accurate date for the battles of Ahab.

There has grown up, in short, a huge body of knowledge, ordered, accurate, illustrated, fixed neatly in time and space and provided with instructive analogues to explain our difficulties and resolve our uncertainties.

Nevertheless the sad fact remains, that Old Testament is not very popular in our seminaries, and in consequence the students often give some cause for the complaint of the bishops and their examining chaplains that the men do not know their Bibles. It is necessary to ask at this point what the knowledge of Old Testament is that is required of ordinands. First there is an all-over familiarity with the persons and narratives of the Old Testament. This can only be achieved by assiduous reading, and it is a sad fact that most of our students come to us from homes where the Bible was not read as a part of their childhood training. The lack of this childhood familiarity with the scriptural story is much to be regretted, and in my experience nothing quite makes up for it, but it can be replaced to a great extent if the student will make the effort to read a good large portion of the Bible daily. It takes some courage, and there is no substitute for it, and nobody can do it for the student, neither his teacher nor anyone else.

Unfortunately the tendency of recent revisions of the lectionaries of Anglican Prayer Books has not been helpful to the Bible reading habit.

The first framers of the Book of Common Prayer provided a good deal of reading according to a scheme that was simple and seldom broken into: anyone who read the lessons would read the greater part of the Old Testament in a year, and the whole of the New Testament twice. This elementary knowledge, this familiarity with the Bible, just as it is, is the basis of all the uses to which the Old Testament may be put, and the bishops are quite right to require it of ordinands.

6. The bishops are right in expecting ordinands to know the Old Testament, but this immediately suggests two other questions. (1) What sort of knowledge should be required? (2) What is to be done with this knowledge, how is it to be fitted into the whole preparation of the ordinand, and—even more important—how is it to be applied and used in the ministry of the ordinand?

I think that the first question is susceptible of a fairly easy answer. The second is by no means easy and will require careful thought and the cooperation of all the members of theological faculties. It will require us to consider anew, and perhaps to restate the purpose of the Old Testament in the scheme of Anglican education, and its relevance to the body of Anglican dogma. It is obvious that conclusions of this sort cannot be reached quickly, but I think it is important that discussions should begin, and, at least, tentative decisions should be made, and tentative measures taken to remedy the present state of things.

(1) What sort of knowledge should be required?

First let it be said that there is a sort of Old Testament knowledge which is of very dubious utility. This consists of picking out memorable texts and requiring the student to locate them in the Bible. The usual Old Testament comprehensive examination often requires nothing but a knowledge of this sort. The student is tempted to treat the scriptures as a sort of mine of high grade ore which contains numerous nuggets which are valued for themselves while the matrix is utterly ignored. This perhaps arises from the protestant fashion of expounding isolated texts as things of authority in themselves; a recoil from this fragmentation of the Old Testament may account for the substitution of the study of archaeology and related subjects for the study of the Old Testament. It may also account for the fact that, perhaps without knowing it, many theological students feel an apathy about the Old Testament or even display a slight hostility towards it. Most certainly many students resent the examinations which they feel are tricky, or trivial, or designed to test their knowledge of the examiner's personal interests.

Obviously some more worthy form of biblical knowledge must be demanded of our students. The following suggestions are put forward with great diffidence. They are merely exploratory. First there is need for a more explicit recognition that the Old Testament fits into the Church's system of dogmatics. In these days, when, in certain quarters, there is more than a suggestion that the Church is not tied

to any specific doctrinal formulation, when dogma—in certain quarters—is a bad word, when there is a demand for reinterpretation of certain doctrines, when there is a suggestion that truth changes with the times and its most trustworthy criterion is up-to-dateness, the Old Testament is resisted—consciously or not—because it is old. To restore it to esteem in the eyes of the young it will be necessary to define its place and value in the scheme of Christian truth. Is it too much to hope that such a definition should be made by authority? The Old Testament—not to say the whole Bible—has too long suffered from a negative attitude on the part of some of those who should be its staunch defenders. We have heard so much of the disunity of the Pentateuch, the unreliability of the history, the uncertainty of authorship, the unmiraculous character of revelation that we have no right to be surprised at the ordinary ordinand when he displays no enthusiasm for what is, seemingly, a document belonging to the naughty childhood of religion.

The first thing then is for all of us to value the Holy Scriptures of the Old and New Testaments as part of the essential treasure of our Christianity which is to be known not because it is our duty only, but also as enriching and deepening our Christian lives.

The second thing is to concentrate on the text and not on the commentaries. It is the conviction of those societies which distribute the Holy Scriptures that the Bible is the best interpreter of its own message. We may hesitate to give complete assent to this opinion but it is probably true that, given some grounding in the teachings of the Church, the attentive reader may do better without the commentaries. Those that are exegetical are likely to lose the reader in endless technical matters which have very little to do with religion. Those that are expository supply him with ready-made opinions, or attempt to relieve him of the task of making his own meditations. In either case the student is getting something other than the words of the Bible.

There are many good books which give short introductions to the books of the Bible; these can be read if a minimum of historical setting and other information is required and the uses of a biblical dictionary, a concordance and an atlas are obvious. First of all, however, the text of the scriptures should be allowed to speak for itself. It may be that, under the guidance of the Spirit, the Bible will again begin to speak directly to the hearts of our students, to encourage, to reprove and to enlighten.

And lastly the specifically religious use of the Bible should be encouraged. In these days much is demanded of students, some would say too much. First there is some tension between the professors of the old subjects, history, systematic theology, biblical studies and the like, and the professors of the new, psychology, Christian Education, pastoral activities and so on. Competition for a student's time is keen and the commonly pragmatic mind of youth is likely to prefer those

activities which appear to him to be useful. Time for reflection is hard to find, time for worship is curtailed by the demands of an overloaded curriculum. Even the daily offices of the Church suffer which is a pity because they could be of help in making the students familiar with the Bible if the old long lections could be restored in seminary chapels.

This constant adding to the burden of students' activity must somehow be stopped and the primacy of religious observance in the horarium restored. Most theological faculties would agree to this in principle. In practice they would say that it simply isn't practical. They would continue to use the time available for activities, for lectures, for papers, for visits to conferences, for all the things that keep the man in training for the ministry in a constant flutter of business. Somehow or other we must check this and reassert the claim of spiritual activity, of ascetical training to a good share of the time available. Of this spiritual training the reading of and meditation on the scriptures would form a substantial part and there is every reason to believe that those who had been through it would soon begin to satisfy their examiners and delight their bishops with a knowledge of the Bible not only adequate, but also profound, not only intellectual but spiritual, not acquired as a chore but sought after as a treasure of the spirit.

THE SOCIAL IMPLICATION OF THE HOLY EUCHARIST

By GERALD C. ROBERTSON

The function of a Sacrament is to bridge the gulf between natural and supernatural, between visible action and invisible grace. The vocation of Christian sacramentalists is to employ the Sacrament of the Altar in such a way that they may be inspired and strengthened to mold the circumstances of their world that it may resemble the Kingdom of Heaven. If we are to do this for ourselves, we must come to understand the social and ethical implications of the Holy Eucharist as we celebrate it, and it will be proper for us to seek enlightenment by comparing this with other liturgies in use within the Anglican Communion, as well as with the earliest Christian liturgies that have been discovered.

In Dr. Sandy's *Outlines of the Life of Christ* it is said that "the actions and words of Jesus at the Last Supper appear to have connections both backwards and forward; backwards with the other meals which our Lord ate together with His disciples, and forward with those common meals which were a feature of the early Church in Acts". If this is true, the rite must be derived not from the Passover or from any yearly feast of Israel, but from the frequent *fellowship-meals* which

a religious teacher of the time would share with his disciples. Such meals began with a formal blessing over bread, which was always expressed as a thanksgiving. This bread itself was broken and distributed among the disciples by their leader. The meal concluded with a blessing in the form of a thanksgiving over a cup of wine which was then shared by those present. In the Institution-Narratives of the Gospel, Jesus simply adds to these actions the identification of the bread with His Body and of the wine with His Blood. From the thanksgivings pronounced this service took the name by which it has generally been known; *eucharist* is simply Greek for thanksgiving. Nothing that St. Paul has to say about the *Lord's Supper* is at variance with this picture.

In the second century Justin Martyr shows the same rite as observed within a settled Church. The preliminaries consist in: 1—lections from "memoirs of the Apostles or the writings of the Prophets"; 2—a sermon by the "president"; 3—common prayers for all men, said standing; 4—the kiss of peace, expressing fellowship. The principal part of this Eucharist is formed by: 5—presentation to the "president" of bread and a cup of wine and water; 6—praise, prayer and thanksgiving, offered to the Father through the Son and the Holy Spirit, for the creation of the world and all that therein is for man's sake and for the deliverance from evil and redemption through the Passion, offered by the "president" extemporaneously; 7—administration by the deacons to those present of the bread and the cup over which thanks has been given (which were also conveyed to absent members). Discussing the significance of this rite, Justin says, "as through the Word of God, Jesus Christ our Saviour was Incarnate and took flesh and blood for our salvation, so also we have been taught that the food over which thanks has been given through the word of prayer which is from Him (by which food our blood and flesh are nourished by assimilation) is the flesh and blood of that Jesus who became incarnate."

In the sixteenth and seventeenth centuries, when religion as well as social order accepted a doctrine of self-assertive humanism, many Christians even within the Church of England substituted for the Eucharist a non-sacramental and individual type of worship. Yet the greater part of Christendom did retain the Eucharist as the central act of worship, and the present century has seen a steady growth of the Liturgical Movement within the Anglican Churches and elsewhere. There are few who will now deny that it is our Lord's will that this Divine Act should be perpetuated, and few who will question that Christ intended to use this as a means of drawing all men unto Himself. We will therefore find it helpful and timely, as Christians and as citizens of the contemporary world, to weigh the social implications of the Holy Eucharist.

St. Paul expresses the corporate nature of the Church in telling us that "we who are many are one Body in Christ and severally members

one of another" (Rom. 12:5). This is true in terms of politics, the family, industrial relations, all social acts; most of all it is true when we approach the Throne of God in adoration. Secular atomism has urged men to seek God individualistically rather than to maintain the peace and harmony that comes from the corporate worship of Christ in the liturgy. Therefore the liturgy must be rescued from individualistic perversions. Its corporate character must again be proclaimed. But we must examine the liturgy in order to understand its meaning fully before we can make a convincing proclamation. We must study its central parts from a socio-liturgical point of view.

No section of the liturgy contains more social dynamic than the Offertory. Yet there is no part of the service which seems less significant to the usual worshipper. Most of its ancient ceremonies have been eliminated so that it has degenerated into an interlude in which the priest prepares the elements while the people listen to organ music and the sidesmen gather alms to meet the cost of maintaining the parish. There is a need to restore the original Offertory so that Churchmen may come to know the meaning of "alms and oblations". In former time each worshipping family brought to the church some portion of what that family had actually grown or manufactured, and gave it to the church-wardens at the door. In exchange each person was given a piece of holy bread, to be carried in his own hands at the Offertory to the waiting priest. The priest received these offerings and laid them all upon the Altar to represent the creative labor of the faithful, and there they were blessed to become the Body of the Lord. The common task was sanctified. The bread was a true and significant medium for the Lord Christ to use in the giving of Himself. Workers offered their labor to the *Worker* that He might work His will in it and in them. Some of the old prayers which have come down to us express this fact, and so give a meaning to this part of the liturgy which can never be set forth by "All things come of thee" which is commonly used in American parishes. The ancient prayers were said as the priest took the bread, symbol of man's toil, and presented it to God. An example may be given from the Egyptian Liturgy of St. Mark. "The sacrifices of those who offer, their oblations, their thank-offerings, do thou O God receive at thy holy celestial and immaterial altar of incense in the mighty heavens, by the ministry of thine archangel: . . . As thou didst receive the gifts of the righteous Abel . . . and the two mites of the widow, so receive the offerings of these people and grant unto them in return for corruptible things incorruptible, for earthly things heavenly, for temporal things eternal".

What do the faithful offer to God? First they offer all the hard work they have done, their creative work in factories and shops and offices and in the fields, teachers in their class-rooms, mothers in their homes. These are the tasks, common though they may be, that keep us in the round of duty, the labors of which the greater part of life consists. If

we know that we are to present these necessary works at the Altar of our God, this will determine the way in which we regard them, for we are to add them not only to the faithful labor of other men but to the work of God Most High. Next, liturgical worshippers at the Offertory present to God the common life, its comradeships, its loves, its shared endeavor. The common life has much evil in it, and that we cannot offer to God; we must not lay before Him our racial intolerance, wage-slavery, prostitution of the arts, marriage failures. Overcome by corruption though we may be, we should have confidence to see that the evil is not with the common man, but with those who find means of exploiting him. Perhaps a parody on the Offertory prayer might be made: "Here, Lord, are the Little People in their weakness, in simplicity of good desires; here are man's inter-relationships, here is society. Do thou confound the mighty who exploit and all who make a lie. Let the oppressed be free! God save the State!" In the third place, we offer to God the Church on earth, that peculiar People called out from the nations to share in the task of the world's redemption. The Church is impotent until it is offered to God. Its defects no man can deny, worldliness, cowardice, compromise with power and wealth. Yet in looking at the Church's weakness we ought not to fail to see its goodness, which is expressed in the lives of the faithful as they try to overcome their weakness by frequenting the Sacraments of Penance and Holy Communion. What wealth of goodness one sees in the countless prayers of simple folk! When Christians offer to God such holiness as may be theirs to offer, God makes that holiness His own. Bishop Sheen's summary in *This Is The Mass* may be accepted by all of us. "Lord, we all stand here in your sight, we your witnesses throughout the world, united in the brotherhood of faith and of hope, all we, Lord, who in your holy will and grace are sons of the Church you so deeply love. Here is your Vicar who most fully bears in your Name the burden and care of all the churches; here is your flock, men good and bad, the strong of heart and those who are fearful, all come together to await your blessing. And by their side stand those who even now do look upon your face; here are your Apostles, your Martyrs, your beloved, your chosen ones. In sacramental union they are one with us; despite our failings and our sinfulness they join to our offering the fellowship of the Saints."

As one advances from the Offertory to the Consecration, the mystery and the glory increases. Some of the great mystics have declared the Sanctus to be a glimpse into Heaven, while in the sublime mystery of the Consecration we see what God can do when He takes man's limitation upon Himself. We cannot go to God; He comes to us instead. Nothing less than this is His answer to the most pressing of human needs, the need for Him. The Incarnate Christ dwells corporeally in our midst. When Jesus said, "This is my Body, this is my Blood", He did not mean any carnal miracle. Nothing happens at the Altar which

changes the bread into something that in outer semblance is not still bread, or the wine into something that in outer semblance is not still wine. Jesus means that in the Sacrament He uses a Body made of wheat precisely as in Palestine He once used a Body made of flesh and bones, that in that Body of bread He expresses Himself to us, is present with us, loves us, helps us; and this we know to be so. From the Consecration we learn that any material thing is insignificant until God makes use of it, that matter is meaningless unless it may have a destiny beyond its dead and changeless self. If there is nothing beyond the material this world is a senseless horror; only if spirit makes use of the material do meaning and hope become possible. As Spirit within matter, dwelling in the Blessed Sacrament, our Lord not only feeds the body; He feeds the soul as well, the inmost and immortal self. Since this is so in the Sacrament of the Altar, should it not be so by analogy in respect to family, city, nation, world? Do material goals, things pursued, worked for, hoarded, fought for, give society a meaning? Most of our social sorrow and of civilization's failure comes from man's pursuit of what is in a pay-envelope in preference to Ultimate Reality. Souls, not things, give meaning to society, human souls that live and learn and suffer and love. When used for spiritual ends, society is like the Host, a holy instrument of and for God. In the words of Canon Bell, "From Jesus making Bread His Body for the nourishing of man, it is possible to learn the insignificance of the social envelope apart from spirit. If we should indeed learn this we should find ourselves delivered from that sense of social futility which is always the final state of those who value things per se".

This brings us to the pleading of the Sacrifice. In the American rite, as in the proposed English book, the pleading of the Sacrifice follows the Consecration immediately instead of being placed after Communion as in the current English Book of Common Prayer. That order is also followed in the South African Anglican Province and in the Episcopal Church of Scotland. As soon as Jesus is in the midst according to His appointment, the priest who acts on behalf of the whole body of the faithful lifts Him up to Heaven and offers Him as Perfect Sacrifice, praying that by His merits and death all the world may obtain remission of sins, praying also that men and women may be so filled with Him that their poor lives may become a worthy sacrifice. Sacrifice is the giving to God of something by which we re-dedicate to Him ourselves and make reparation for our selfishness, pride and blindness to Reality. In ancient times men sought to effect this re-dedication by means of animals, fruits, gifts of money, even their first-born. Some of the sacrificial rites adopted were dreadful or pathetic. But no material or symbolic sacrifice is enough. The only adequate sacrifice is a perfect human life laid down for God to use. But what human life is perfect? Man is called to give what he does not have to give. Therefore, as our Blessed Lord laid down His human life for us, so we "present

unto thee, O Lord, ourselves, our souls and bodies, to be a reasonable, holy and living sacrifice unto thee" (American BCP, p. 81). The consecrated Bread and Wine are Christ's embodiment, a vehicle of that redeeming life and death whereby He makes reconciliation between the perfect righteousness of God and man's deficiencies. The Liturgy is a pleading of this Christian Sacrifice.

After the people have received the Divine Life, the priest's voice is heard once more, leading the people in a Thanksgiving for what God has bestowed. The earliest liturgies did not include this act within the drama of the Mass. Communion ended the rite, just as the sharing in the Cup of Blessing had been the last act of the chaburah meal to which Jesus had attached this new meaning. There was no Thanksgiving at the end of the earliest Eucharist because the sharing in the life of Christ was counted the greatest Thanksgiving; such an addition could appear only after the Church had lost contact with the Jewish origins of the rite, and this did not happen before the fourth century. Modern Christians, however, feel impelled to add a Thanksgiving to God for the gift of His Son, even though most people today have lost the capacity truly to be thankful. Most of us assume that the world belongs to man and may be used as he sees fit, wasted, fought for, denied when it proves cruel or disappointing. The optimist thinks of the world as something that he may control, the pessimist or cynic as something which he should escape, and both attitudes are conceited and absurd. The world is a gift to man, not an absolute possession, and in itself it need not necessarily demand thanksgiving because it cannot satisfy human longing. The Christian's task is to give meaning to the world and to the kindred souls who inhabit it, a meaning which is seen in the Cross. There one sees the salvation of man from all that the world contains that may turn man from his true purpose in life which is to love God. Perceiving this we can see the drama of Redemption enacted in the liturgy of the Church, and can say with the Saints of old a prayer of gratitude. "Almighty and everlasting God, we most heartily thank thee for that thou dost vouchsafe to feed us. . . . Assist us by thy grace, that we may continue in that holy fellowship, and do all such good works as thou hast prepared for us to walk in . . . world without end. Amen".

BOOK NOTES

Eucharist and Sacrifice by Gustaf Aulén. Philadelphia: Muhlenberg Press, 1958, (\$3.50).

Bishop Aulén is convinced that the most central theme of the Holy Eucharist is sacrifice, but that in spite of verbal agreement reached at the conference in Edinburgh (1937) it remains one of the principal areas of misunderstanding and disagree-

ment in ecumenical discussions. His book summarizes the points of view of the main traditions of Christendom, giving especial attention to recent Anglican contributions, and then goes into an extremely interesting and acute analysis of Luther's own views on sacrifice in the Eucharist. Finding that the Reformation points away from itself to the Bible, Aulén devotes a section to New Testament interpretations, and ends with his own conclusions.

As one reads Aulén's resumé of the Anglican position, one feels that the author has understood and sees the value of this position, even when he rejects part or all of it. Yet, an exception must be made to this: he almost, but not quite, understands what the Anglican writers with whom he deals mean when they speak of the relation of Christ to His Church. He rejects any assertion that we "offer Christ" in the Eucharist, and as he understands this we heartily agree. But because of his failure to see what the Anglicans mean by the union of Christ and His Body, he cannot see how our self-offering and Christ's self-offering can be so united that to say Christ offers Himself in and through us, and that we in offering are presenting Christ's offering, is to say the same thing.

CHARLES L. WINTERS

The Jung Codex edited by F. L. Cross. New York: Morehouse, 1955, (\$3.75).

The Gnostic Problem by Robert McLachan Wilson. London: A. R. Mowbray & Co. Ltd., 1958, (\$4.90).

The appearance of these two studies, like the publication of Hans Leisegang's *Die Gnosis*, in German, in 1955, are significant of a renewed interest in Gnosticism. This is in part due to the substantial elements of Gnosticism present today in the theology of Paul Tillich and in Phenomenological Existentialism. It is in part due to the presence of certain Gnostic incentives in the writings of Berdyaev. The first of these volumes is a translation in English, with an introduction, to commentaries upon Valentinus' *Gospel of Truth*, a work apparently written when he was a candidate for the episcopate in Rome. This manuscript, referred to vaguely by Irenaeus and others, was discovered at Nag Mammadi in Upper Egypt in 1945. The *Gospel of Truth* refrains from any mention of the usual Gnostic pleroma of descending Aeons spaced out in conformity to proto-Ptolomaic astronomy, but reaffirms that salvation consists in the rediscovery of the lost knowledge of the Father, a Father-Originator who lurks behind the abortive Demi-urge who has created this estranged and fallen world. The recovery of the *Gospel of Truth* demonstrates how ancient Gnosticism could masquerade as Christianity even to the point of coming close to putting its chief herisarch upon the Papal throne.

Wilson's *The Gnostic Problem* is a careful study of the origins of Gnosticism in Syrian and Jewish thought, painstakingly studying the documents now made extant, and judiciously estimating the impact of Gnosticism upon the Jewish communities of the Diaspora and the early Christian congregations. It is rewarding reading, especially in a time when new, and yet old, forms of Gnosticism have invaded Christianity.

W. O. CROSS

The Creative Years by Reuel L. Howe. Greenwich, Connecticut: The Seabury Press, 1959, (\$3.50).

How many of your youthful illusions have you been compelled to discard? Probably most of them if you have reached the age of thirty-five. This is not to suggest that life ends at forty, but rather that the middle years present a demand that we check up on our motives for living. This checking up business requires a revolutionary religious orientation, which is as deep and as broad as the totality of daily experience.

Dr. Howe's argument in this unusual book is that the middle years present a creative opportunity to revolve the meaning of our personal lives, our love relationships, our sex life, our parental responsibilities, the meaning of our work and the significance of our religious faith.

The questions which are implicit in our existence during these years are raised around the experience of Dick and Julie Foster and their children in a down-to-earth realistic manner. These questions are so real and so universal that they could well serve as the basis for an adult discussion group for mature people.

VESPER O. WARD

Religion and Culture: Essays in Honor of Paul Tillich, edited by Walter Leibrecht. New York: Harper and Brothers, 1959, (\$7.50).

This *Festschrift* for Tillich is an outstanding collection of essays, if only by virtue of the astonishing variety of the points of view of the contributors. Erich Fromm; Karl Jaspers; R. Niebuhr; Gustave Weigel, S. J.; George Florovsky; Gabriel Marcel; R. Bultmann; and Charles Malik are only a few selected to indicate the true scholastic ecumenicity represented. The book, of course, is in no sense about Tillich or his thought; the authors are often opposed to him. The unity of the collection of essays is provided only by the common interest which the writers share with Tillich concerning the relation of religion to culture.

CHARLES L. WINTERS

Foundations of the Responsible Society by Walter G. Muelder. New York: Abingdon Press, 1959, (\$6.00).

A comprehensive, illuminating and exhaustive study of the nature of current familial, social, political, economic, industrial and communal institutions in the light of the Christian ethic. The thread upon which these brilliant beads of sociological wisdom are strung is the sense of Christian vocation, termed by the author, "responsibility". A provocative, stimulating and constructive analysis of current *mores* and Christian vocation.

W. O. CROSS

Chance and Providence by William G. Pollard. New York: Charles Scribner and Sons, 1958, (\$3.50).

This book calls for a full-length review rather than the limited notice allowed in these book-notes. It is written by a Christian priest who was first a distinguished nuclear physicist. It combines in one thrust two worlds, that of the atom in its splurge of energy and of faith in its reach for the substance of things hoped for. The basic

thesis of the book rests upon the scientific principle of indeterminacy as developed out of modern physics. The concept of Providence is vindicated in the argument that the operations of nature are statistically uniform rather than deterministically mechanical. The Bohr principle of Complementarity becomes a fruitfully manipulated analogy that is carried out of science into ontology. However, the development of this analogy leads somewhat dangerously close, in some statements, to the Averroistic doctrine of the double truth, truths of faith being seen as complimentary to truths of science. There is a danger, obviously, in asserting that there are two realms of truth, one revealed by the Bible and another discovered by science. The book implies, but does not sufficiently develop the theme of Creation by which alone what God has revealed and what He has made are brought together into a single composite of truth. Creational cement to mortice together the truths of faith and reason, in short, a "natural theology", is unfortunately lacking, but obviously demanded if a genuine Christian theism is to be presented. Instead there is a tendency towards an almost Barthian type of Bibliolatry, reinforced by Martin Buber's "It and Thou" formula which accents the tendency towards conceptual dichotomy. One should not attempt to criticize a book in so short a notice but these drawbacks within a most promising thesis can be called attention to in the interests of inspiring Dr. Pollard to work out this problem in greater detail and with less intellectual dichotomy. Dr. Pollard is bridging two worlds, and in the Bohr Principle of Complementarity he has grasped a most promising analogy which should be carried further without the use of such frail material as Fideism and a too superficial use of I and Thou. After all, the Thou that one encounters in human personality, can only come to one through such atomic stuff as human bodies and air vibrations that carry sight and sound. One world sacramentally uses the other and makes communication possible. There can be no Thou without the substance of It. Buber's distinction is illuminating, but overlooks the interlocked relation of nature and grace, of thing and person, of matter and consciousness, of atom and spirit. Dr. Pollard needs, I think, to bring his brilliant analogy into the field of the Christian teaching of Creation, Incarnation and Sacraments, and to discuss these in the light of Complementarity. These doctrines, I feel, are the real bridge between his worlds. As it is, he has written a most promising book that calls for a sequel.

W. O. Cross

The Role of Knowledge in Western Religion by John Herman Randall, Jr. Boston: Starr King Press. 1958, (\$3.50).

For historical, theological and philosophical perspective on the intellectual ventures of Christianity from the first until now, one could hardly find a better account. It is sympathetic and appreciative though written by one who inherited the leader's mantle among the Naturalists. Perhaps a few examples will better illustrate the sinewy quality of the book than a crowded analysis in so cramped a space. In an appreciative examination of the work of the Greek Fathers in the Christological and Trinitarian controversies, Randall says that the theology of Nicea and Chalcedon meant, "the victory of Greek rationalism and humanism over Oriental asceticism and irrational faith." Of St. Thomas he writes, "Thomas turned to Aristotle, not primarily to capture him for the Christian faith, but to vindicate the dignity, worth and power of human nature within that faith . . . Thomas is the great Christian Humanist

and Christian Naturalist." Of Neo-Orthodoxy, he writes, "the new Gospel of Sin has reverted to new idealistic philosophies which are the very quintessence of the Romantic pessimism and *Weltsschmerz* of a century ago, philosophers rooted in an ultimate Romantic voluntarism and irrationalism." There are touches of humour and irony. Speaking of the Existentialists he says, "if Kierkegaard be an authentic and gifted poet whose insights are to be taken seriously, so is Jesus of Nazareth." "Many a German through sharing and commitment found 'existential truth' in the Nazi ideology." He sums up the theological mood of the moment by saying, "since the theologians refuse to find any place for intelligibility, the physicists rush in to identify God with the cosmic yeast. Whether religion be a crusade against the profit system, or a delicious feeling in the spine, or an amateur psychotherapy, or the blasphemies of mathematical physicists, tempted by Gifford lectures, no one today it is clear bothers to know God." For anyone willing to strain his religious concepts through the clarifying sieve of careful examination this book is the answer. I am tempted, as a former pupil of the author, to requote his dedication to Horace Friess so as to refer to "Jack" Randall himself, "*Magistro Dilectissimo et Amico Qui Semper Quid Faciendum Scit.*"

W. O. CROSS

An Introduction to the Theology of the New Testament by Alan Richardson. New York: Harpers. 1958. (\$5.00).

The writing of "Biblical Theology" in recent years has come to be the form in which theologians, exegetes and religious philosophers are expected to express their developed convictions. If anyone is qualified to engage in such an operation, Professor Richardson meets the requirements. He writes well, he has understanding of comparative religion, he knows the background of the Bible. There has been no carelessness in the research that went into the preparation of this volume. The author has made himself familiar with the work of all those whose names he quotes, and with the history of every idea he considers. In his introduction he draws attention to the present paradox of New Testament interpretation, the fact that increasing scepticism about the historian's ability to reconstruct the facts of Christianity in the first century has been accompanied by increasing willingness to accept the early Christian message as true.

Yet these virtues have not been able to deliver this work from the curse which has vitiated every modern effort to compose a theology of the New Testament, or of any other part of the Bible. Many of us will prefer the picture of early Christian belief that is painted by Richardson to the alternative pictures that have been made available by Burrows or Bultmann or Stauffer. Unfortunately there is little evidence that any of these pictures represent the mind of Paul or John or Matthew; we can only be sure that they represent the minds of their respective contemporary authors. An honest "Biblical Theology" will never be created by an author who assumes that the Bible is true, and therefore that it sets forth the truth as he himself perceives it. Only when we recognize that the first Christians were divided in their own opinions, and that we today do not see the truth as any of them saw it, shall we be able to state their teaching with accuracy. But the person who does this will be offering not "Biblical Theology" as a supposed pattern of thought by which all of Scripture can

be interpreted; he will be offering only an exegetical or historical statement of what was believed in those traditions which he has been able to distinguish.

J. H. W. RHYS

We Have This Ministry by Robert N. Rodenmayer. New York: Harper and Brothers, 1959, (\$2.50).

We Have This Ministry is a disturbing book in that it presents the work of the minister in such a way as to condemn us if our vocational motivation is less than Christian. Although Dr. Rodenmayer writes out of the experience of a rich and a reconciling ministry, he does not deal with techniques. The content covers the work of the pastor, the administrator, the preacher, the teacher and the priest; but it is never suggested that these aspects of the ministry can be thus arbitrarily divided. Whatever the minister does, he is always involved in the process of reconciling men to God. It is the recognition of this truth that restores wholeness and direction to the minister's work in today's world.

Every parson should read this book, not to learn new ways of doing things, but to get his spiritual perspective restored. Every candidate for the ministry should read it in order that he may not take lightly the vocation to which he has committed himself.

VESPER O. WARD

Atlas of the Early Christian World by van der Meer and Mohrmann; Translated and Edited by M. F. Hedlund and H. H. Rowley. London: T. Nelson and Sons, 1958, (\$15.00).

When one thinks of an atlas, it is in terms of maps. Descriptive text may be expected, along with photographs of the more interesting sites of the area described, but one usually contemplates by this name a work which is to be read in conjunction with histories, or at least against a background of knowledge of the area and period considered. This work in itself, however, could serve as an introduction to Christian history. While Professor van der Meer's maps are remarkably good, and give one vast amounts of information at a glance, most readers will be even more impressed by the assembly of photographs which illustrate the life and interests of the first six centuries of Christians.

The first map gives a clear identification of the known Church centers of the first century, and subsequent maps carry the process of growth up to the time of Diocletian; the symbols used are easy for anyone to follow. By similar methods one is shown the areas in which each of the Christian writers of the first three centuries worked, and the writers themselves are clearly identified. There follows a sketch of the areas of various patriarchates of the fourth and succeeding centuries, and indications of early diocesan organization. Monuments earlier than A.D. 600 are located, shrines, pilgrim routes and monasteries. Many of the facts here shown at a glance could formerly be discovered only through laborious research.

After the maps come six hundred photographs, frescoes and reliefs illustrating first pagan religious scenes, and then the Christian ones which replaced them. Tombs and their inscriptions are shown, great pagan public buildings and Christian places of

worship, representations of Saints and the ecclesiastical vestments in use, pictures of the ornaments of churches in the fourth and fifth centuries. The wealth of material is overwhelming.

Each of these illustrations is carefully identified in the text, along with descriptions of Christian practices taken from authors of the period. There are brief articles on Christian philosophy, the Eucharist, the structure of the basilica, to name only a few of the items described. The whole work is assembled with skill and taste. Obviously this cannot be a complete text for each of the various topics on which it touches, but one turns from it with the conviction that one has found an introduction to the study of most phases of early Christianity which will render most other volumes of introduction unnecessary.

J. H. W. RHYB

The Slow of Heart by Matthew M. Warren. New York: Harper and Brothers, 1959. (\$2.00).

With the use of a striking phrase from the words of the Risen Lord to the men on the road to Emmaus, "O foolish men and slow of heart to believe", Dr. Warren gives title to some forthright comments on the state of mind, the state of being, of all too many Christians in our times.

In sharp language, with thrusting phrases, he reminds the reader, presumed to be a Christian, and like most of us, apt to complain a little now and then, that only a little reflection will bring to light the fact that in every area of life "we have more than we need". We have more, that is, in every area but that one which counts most in our lives, trust in God, His promises and His gifts already given. We tend too much to think we have been cheated, short-changed; whereas the truth about us is that God has given more than we can use for the development of the good life He wills us to enjoy. We are "fools, and slow of heart to believe."

The eight short chapters, meditations in fact, on the prayer of Thanksgiving in the Eucharist, are informative, realistic, arresting, refreshing to read. Most, if not all, Christians need to be reminded from time to time of the simple facts that "we are favored", that "we belong", that "we are heirs",—heirs of God and joint heirs with Christ. This book will serve to remind with such force, sometimes, as to be almost shocking.

Dr. Warren is well known to many who read the *St. Luke's Journal*. For a time when he was rector of All Saint's, Atlanta, he served on the staff of the School of Theology at Sewanee as lecturer in Christian Education. In this his first book he writes as a teacher, with clarity, dignity and authority.

GEORGE M. ALEXANDER

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